

PICATINNY ARSENAL PFAS PA SOUTHERN BOUNDARY WELL SAMPLING PLAN

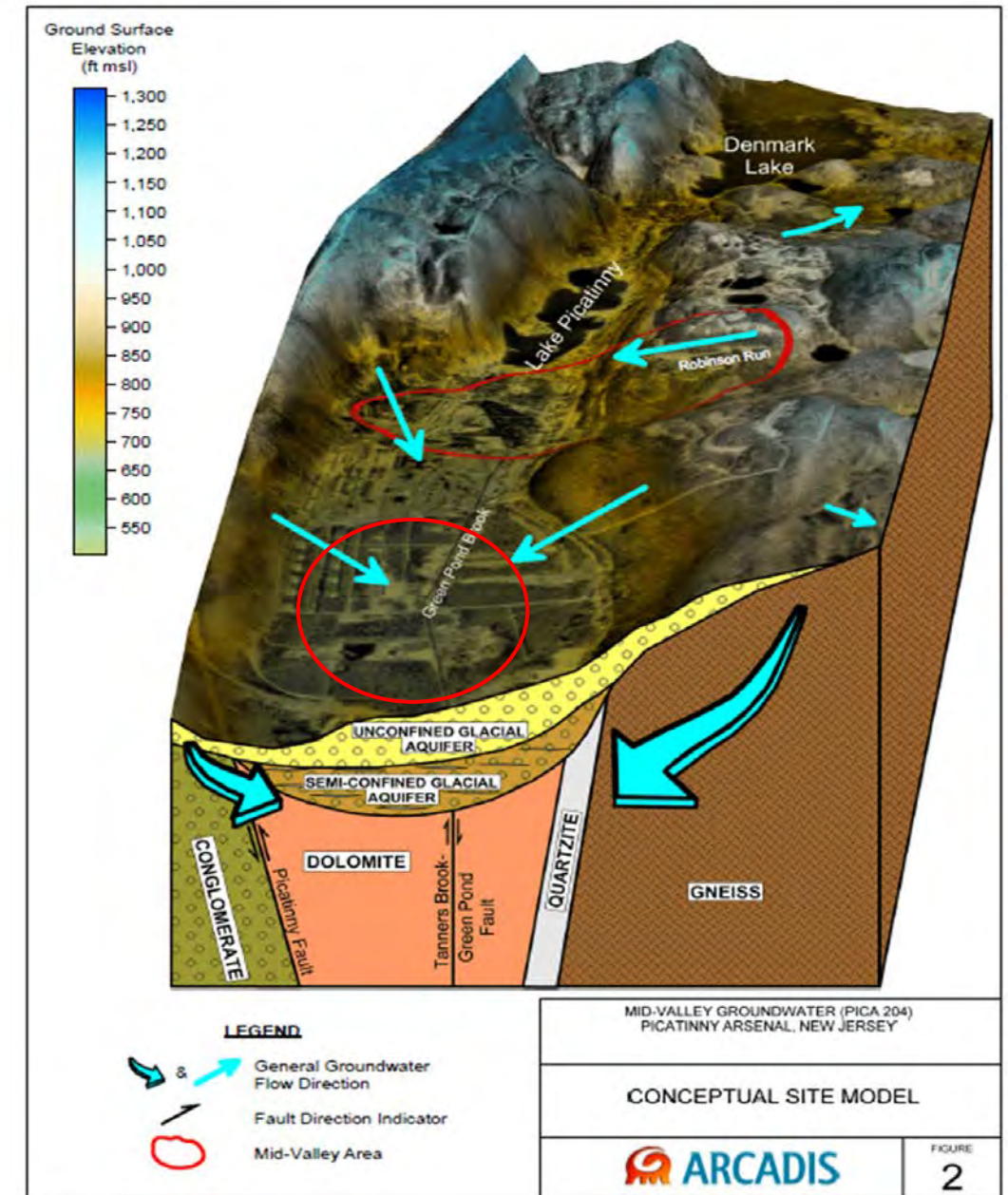
8/29/18

Executive Summary

- NJDEP and USEPA Request to Sample Southern Boundary Wells to evaluate offsite migration at Southern Boundary
- Picatinny Response
 - Pre-SI, PA Phase Sampling of Existing Wells to evaluate risk
 - Sample select well clusters at Southern Boundary to determine offsite migration in all aquifer units at Southern Boundary
 - Sample Green Pond Brook that drains the Southern Boundary as surface water exit point for Picatinny
 - Sample select PFAS AOPIs (potential source areas) identified in PA site visit that may contribute to PFAS migration across Southern Boundary to determine presence of absence of PFAS
 - Sample select existing wells screened in shallow unconfined aquifer at AOPIs.

Site Geology and CSM

- Hydrology
 - Green Pond Brook - is the principal drainage feature at Picatinny
 - Flows to southwest and exits facility approximately 3000 ft south of Area C.
 - Swamp deposits occur sporadically in low-lying areas. Thin layers of organic clays and muck.
 - 4 separate aquifers - unconfined/water table glacial aquifer, upper semi-confined glacial aquifer, lower semi-confined glacial aquifer and bedrock aquifer.
- Geology
 - Soil thickness - 200-250 ft.





USAEC PFAS Preliminary Assessments
Picatinny Arsenal, NJ

AOPIs and Monitoring Wells
Southern Installation Boundary

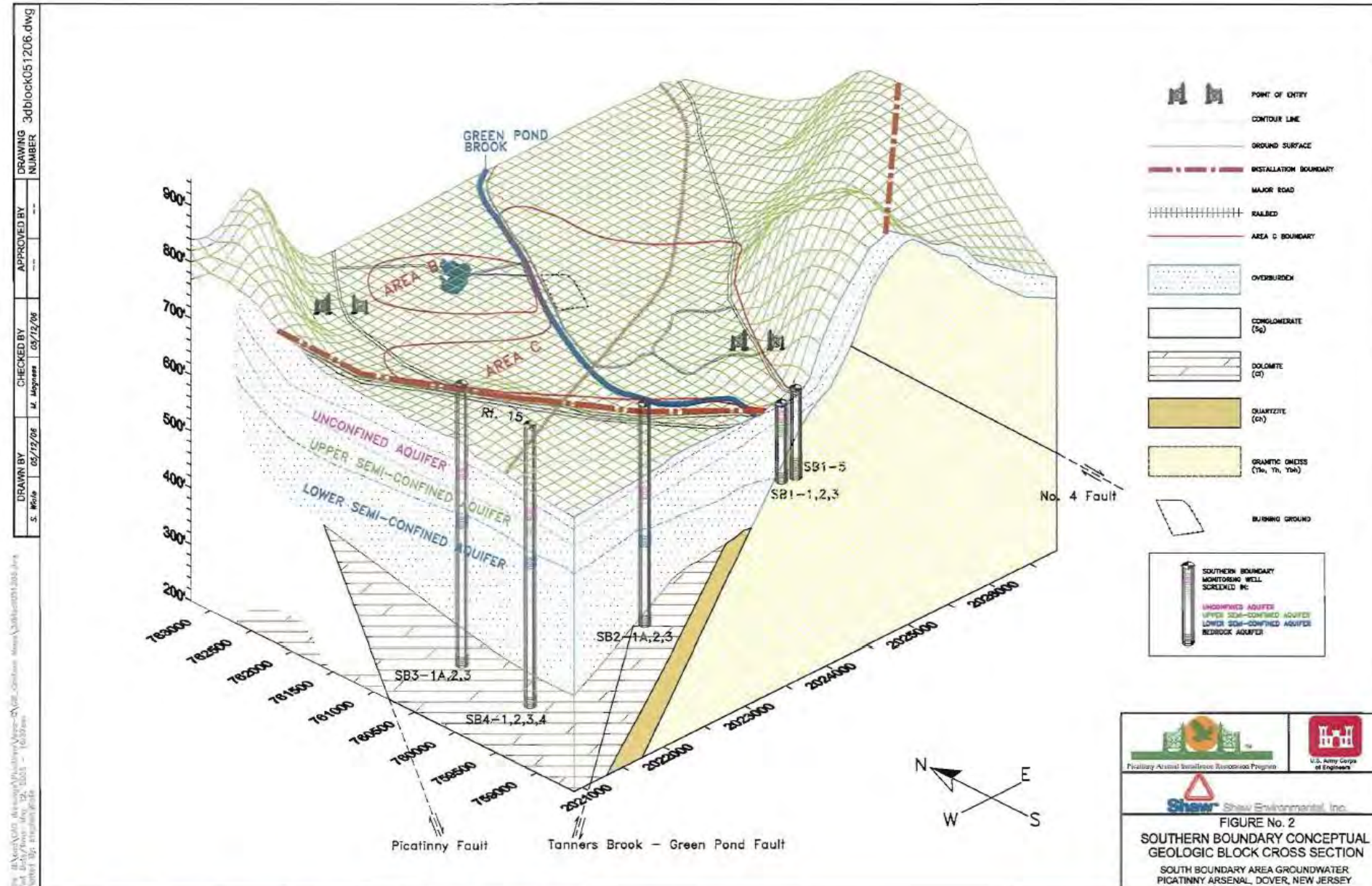


- Installation Boundary
- River/Stream
- Water Body
- AOPI Location
- AFFF Use Area
- Monitoring Wells
- Proposed Sampling Location
- Assumed GW Flow Direction in the Unconfined Aquifer

Coordinate System:
WGS 1984, UTM Zone 18 North

Southern Boundary Sampling

Wells SB1-5, SB1-6 and SB1-7 co-located with SB1 well cluster were not selected for sampling since SB1-5 is screened in bedrock similar to SB1-1 and SB1-6 and SB1-7 are screened in unconfined aquifer similar to SB1-2.



Southern Boundary AOPIs



- Installation Boundary
- ▲ AOPI Location
- Drinking Water Well (On-Installation)
- Water Supply Well (Off-Installation)
- ~~~~~ River/Stream
- ~~~~~ Water Body

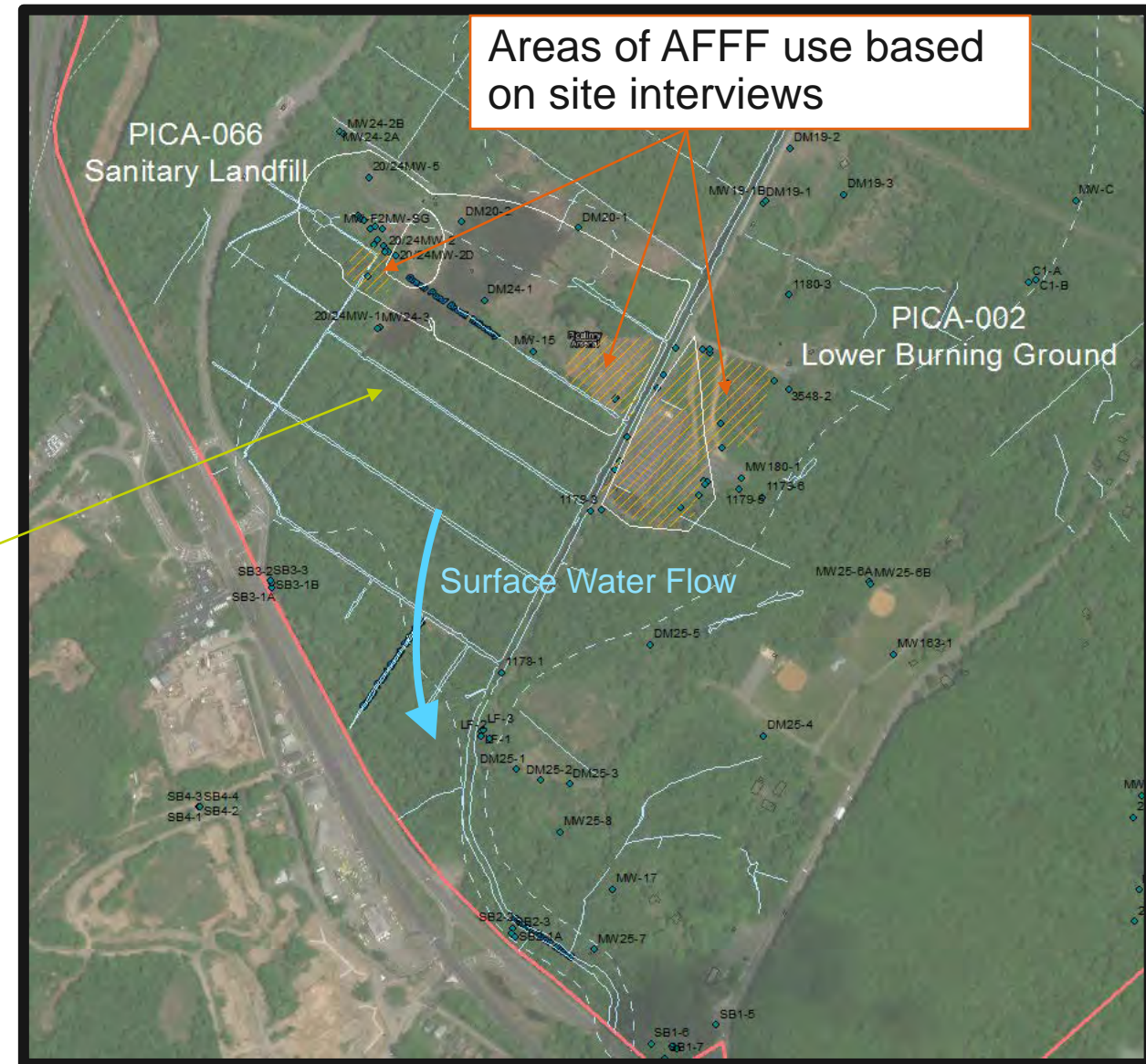
- 1) Pyrotechnic Area/Sanitary Landfill
- 2) Area 1177 – Lower Burning Ground
- 3) Building 169 - Firehouse 1
- 4) Former Building 24 (Chrome plating)
- 5) Former WWTP Facility (Secondary Source)

Documented AFFF AOPIs

AOPI Description	Dates of Relevant Release	Drainage System/ Receiving Water Body	Is there a likely release?	Potentially Affected Media	Overlapping IRP Site and Phase of Work
Area 1177 – Lower Burning Ground	A few times a year, ending in the early 1990s	Surrounding wetlands to Green Pond Brook which leaves site.	Yes	Soil, sediment, surface water, groundwater	PICA-002 – RC, LTM
Pyrotechnic Area and Sanitary Landfill	A few times a year, ending in the early 1990s	Hydro Pond and surrounding wetlands to Green Pond Brook which leaves site.	Yes	Soil, sediment, surface water, groundwater	PICA-066 – RC, LTM PICA-205 – RIP, RA(O)
Former WWTP Facility	Waste Water Treatment Plant was in use until the early 2000s.	WWTP sludge drying bed and leach fields could serve as infiltration points for groundwater.	Secondary Source	Groundwater, soil, surface water.	PICA-070 – RC, LTM
Former Building 24 (chrome plating)	Active until 1987	Bear Swamp Brook to Green Pond Brook which leaves site.	Likely – but not confirmed	Surface water, groundwater, soil	PICA-076 – RIP, RA(O)
Building 169 - Firehouse 1	Approximately 55 gal released over past 9 years, since construction.	Stream to Green Pond Brook., surface runoff to storm water sewer. Drains in building lead to sanitary sewer	Yes	Surface water, groundwater, soil	NA

Sanitary Landfill/Pyrotechnic area and Lower Burning Ground

- Southern area of Arsenal is marshy and has large quantity of organic material making it difficult to extinguish fires
- Occasional fires in this area required use of AFFF suppression – sprayed along fence line/tree line
- Spraying in this area ended in the 90s.
- Sanitary landfill received sludge from historical onsite WWTP
- Number of berms for surface water drainage
 - Flow off-site is to the south via Green Pond Brook
- Upward vertical water trend is likely in this area – so AFFF is not likely to trend deep.
- Large number of monitoring wells for potential sampling locations.

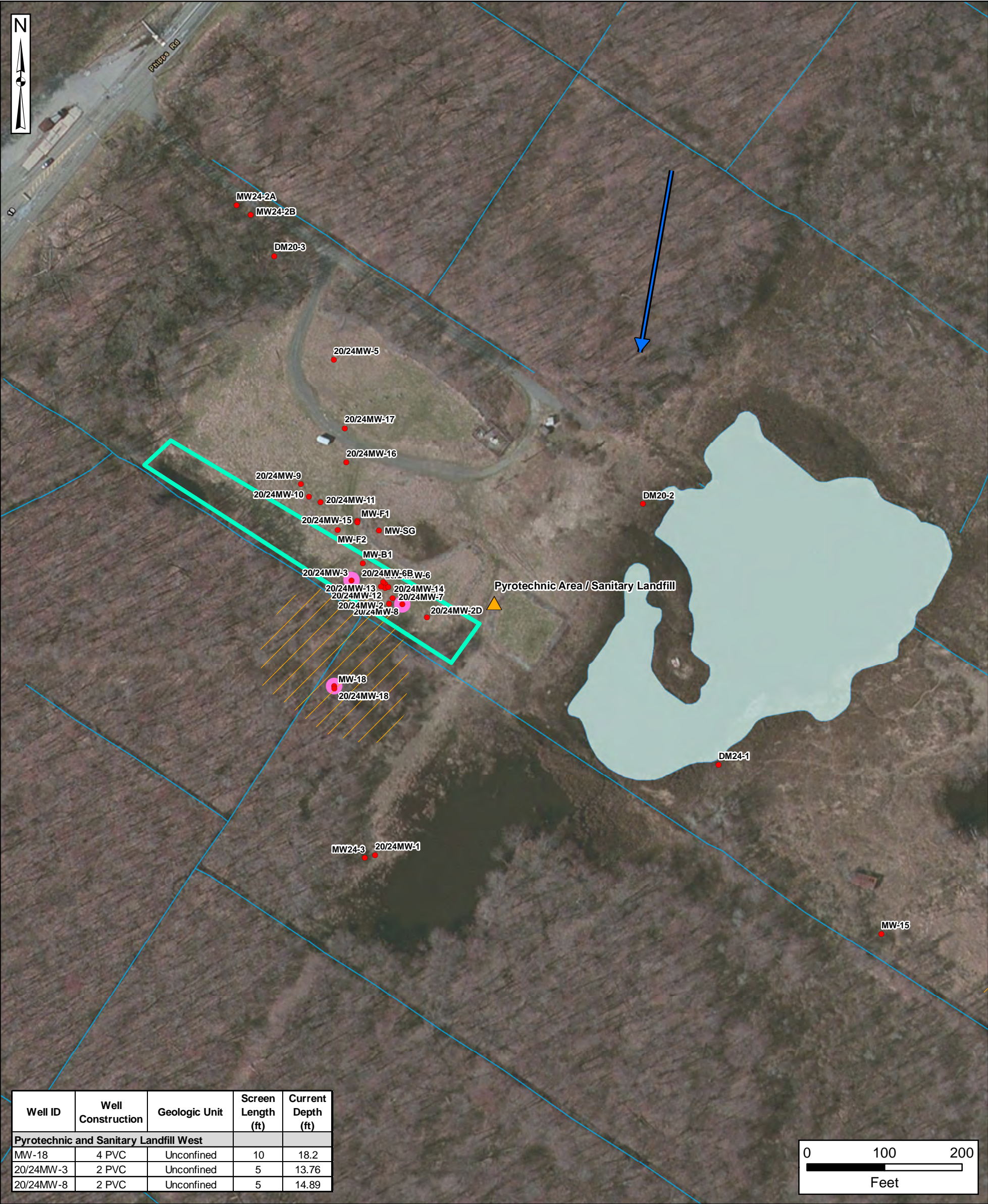




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Picatinny Arsenal, NJ



AOPIs and Monitoring Wells
Pyrotechnic Area and Sanitary Landfill



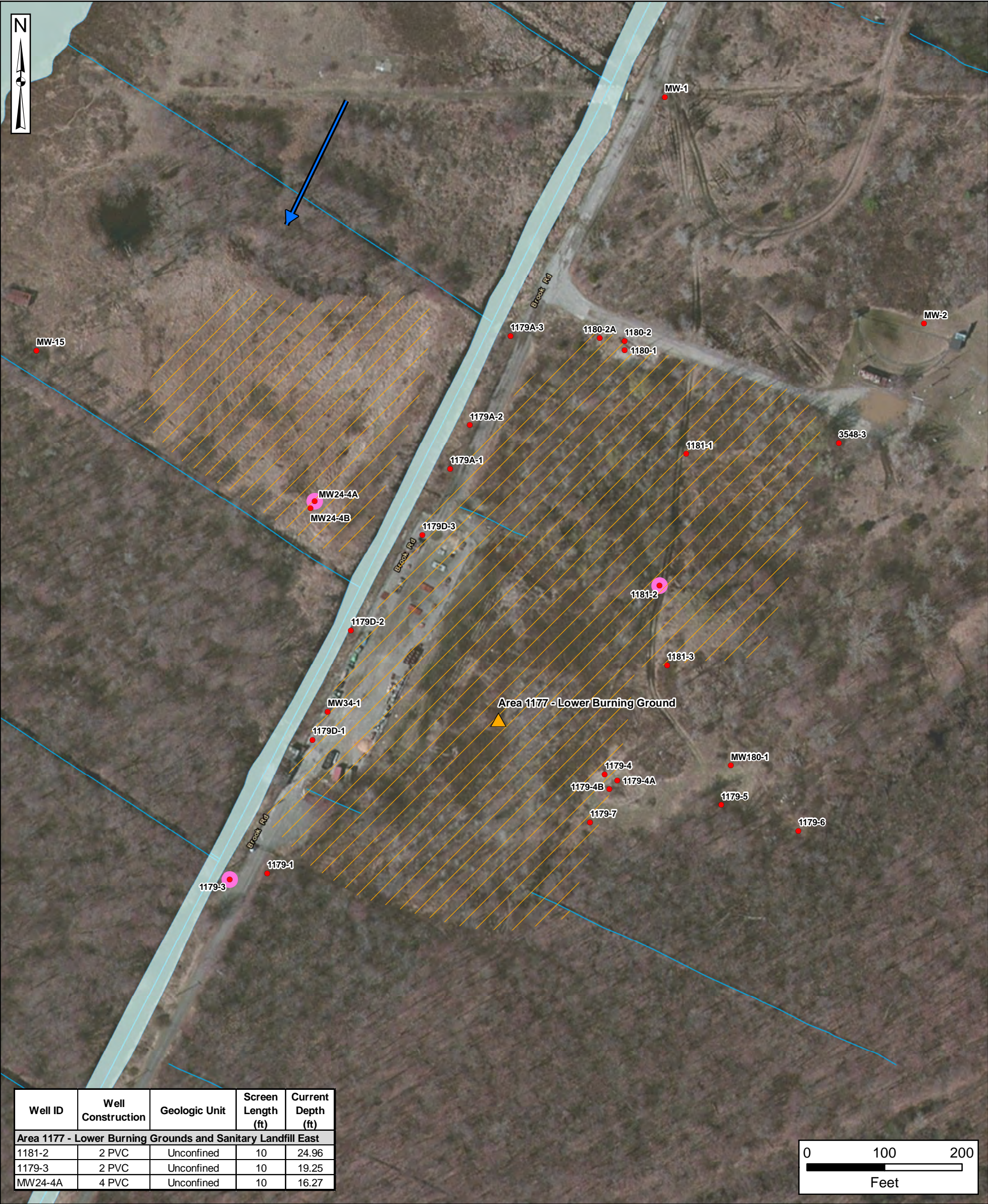
- Installation Boundary
- River/Stream
- Water Body
- AOPi Location
- AFFF Use Area
- Well (EA Data, May 2018)
- Proposed Sampling Location
- Assumed GW Flow Direction in the Unconfined Aquifer
- Potential PFAS Release Area associated with Tertiary Treatment / Spray Field

Coordinate System:
WGS 1984, UTM Zone 18 North



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Picatinny Arsenal, NJ

AOPIs and Monitoring Wells
Area 1177 - Lower Burning Grounds



- Installation Boundary
- River/Stream
- Water Body
- AOPi Location
- AFFF Use Area
- Well (EA Data, May 2018)
- Proposed Sampling Location
- Assumed GW Flow Direction in the Unconfined Aquifer

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Building 169- Firehouse 1

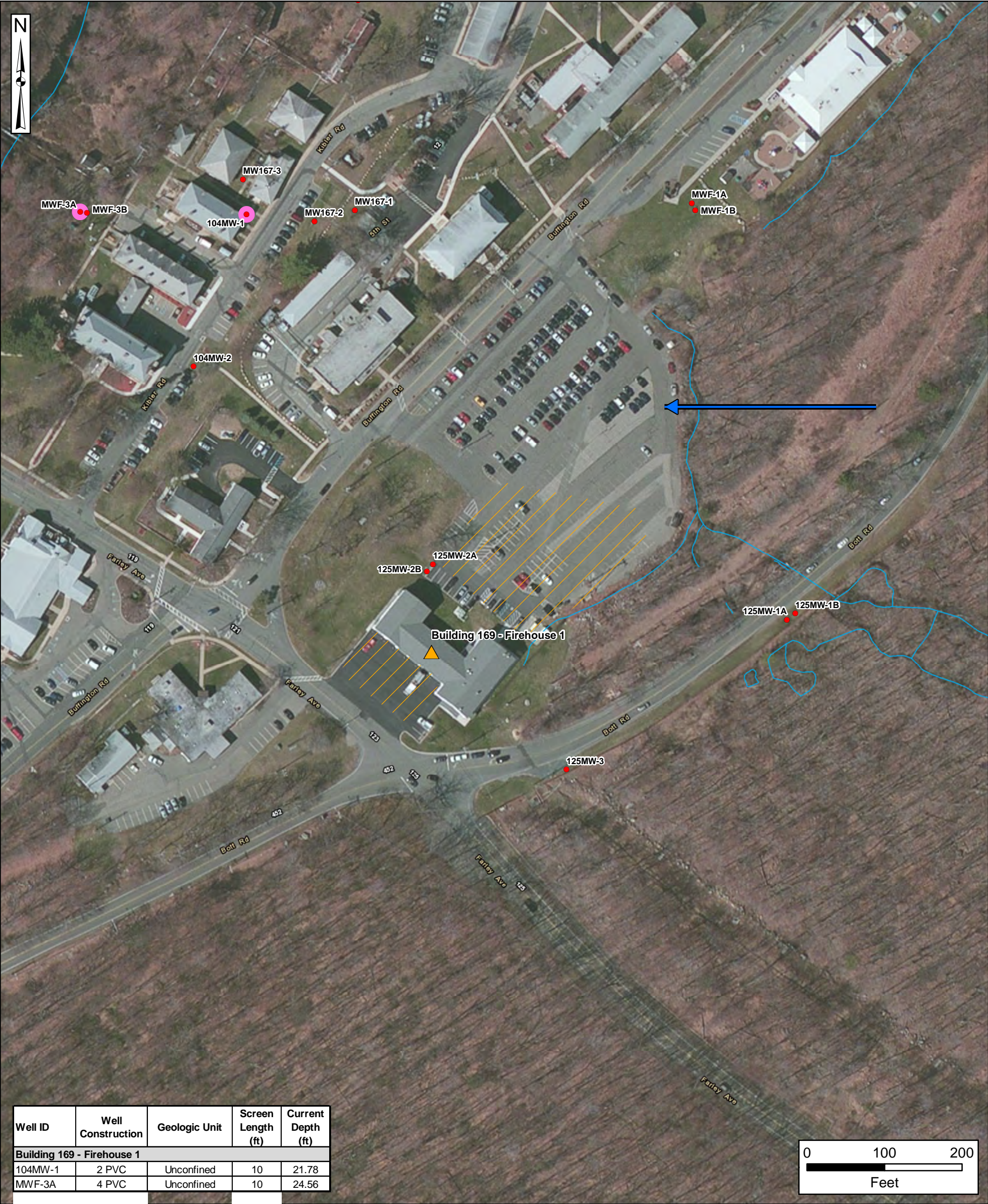
- New Firehouse, a total of approximately 55 gallons of AFFF have been released over past 9 years
- Firehouse is at general topographic high – runoff moves away from site towards roads/brook.





USAEC PFAS Preliminary Assessments
Picatinny Arsenal, NJ

AOPIs and Monitoring Wells
Building 169 - Firehouse 1



- Installation Boundary
- River/Stream
- Water Body
- AOPi Location
- AFFF Use Area
- Well (EA Data, May 2018)
- Proposed Sampling Location
- Assumed GW Flow Direction in the Unconfined Aquifer

Coordinate System:
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Former Building 24 – Chrome Plating

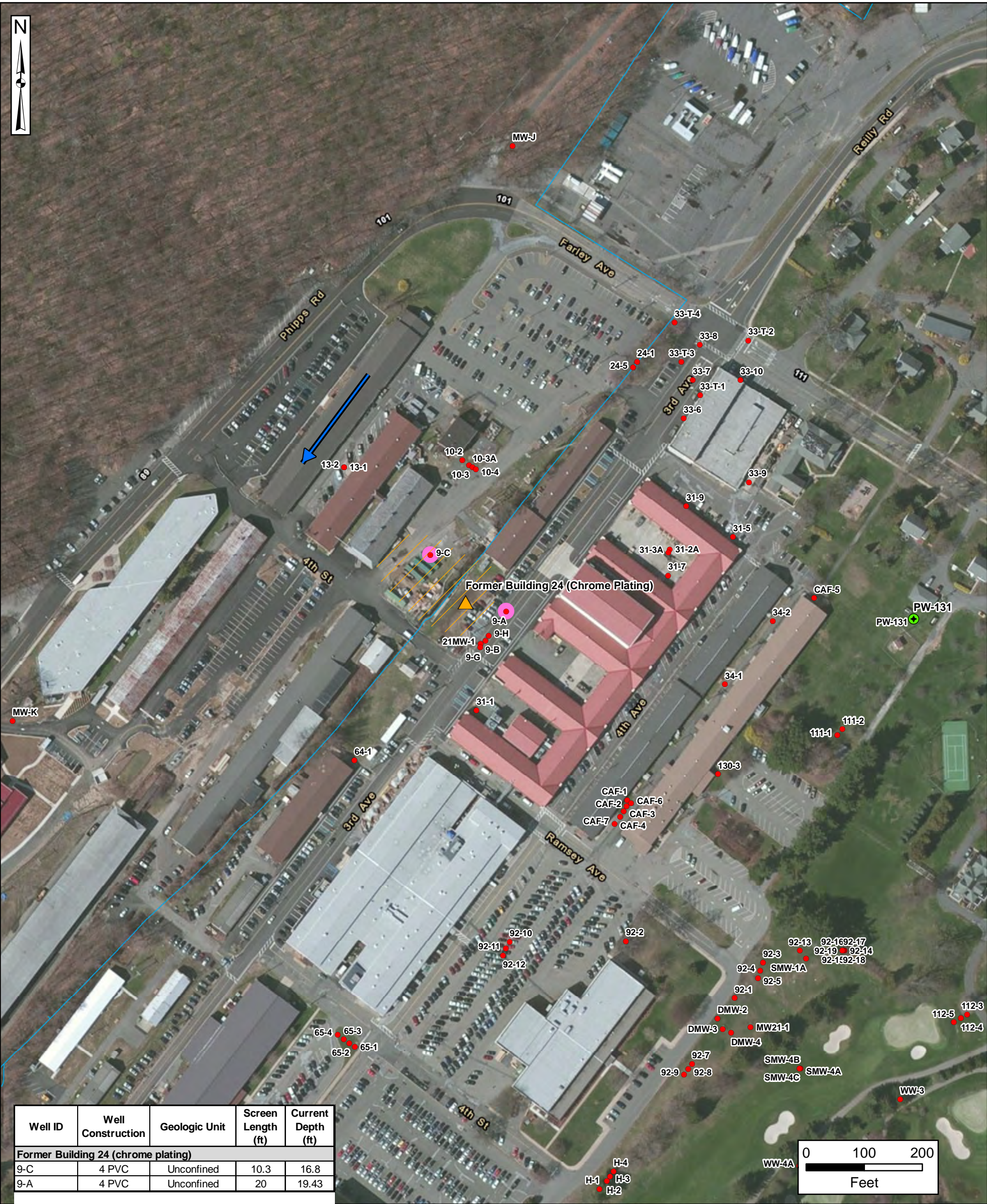
- Former Chrome Plating Facility (active until 1987)
- PFAS presence not confirmed
- Lagoons with plating waste on other side of Bear Swamp Brook, that connects to Green Pond Brook





USAEC PFAS Preliminary Assessments
Picatinny Arsenal, NJ

AOPIs and Monitoring Wells
Building 24

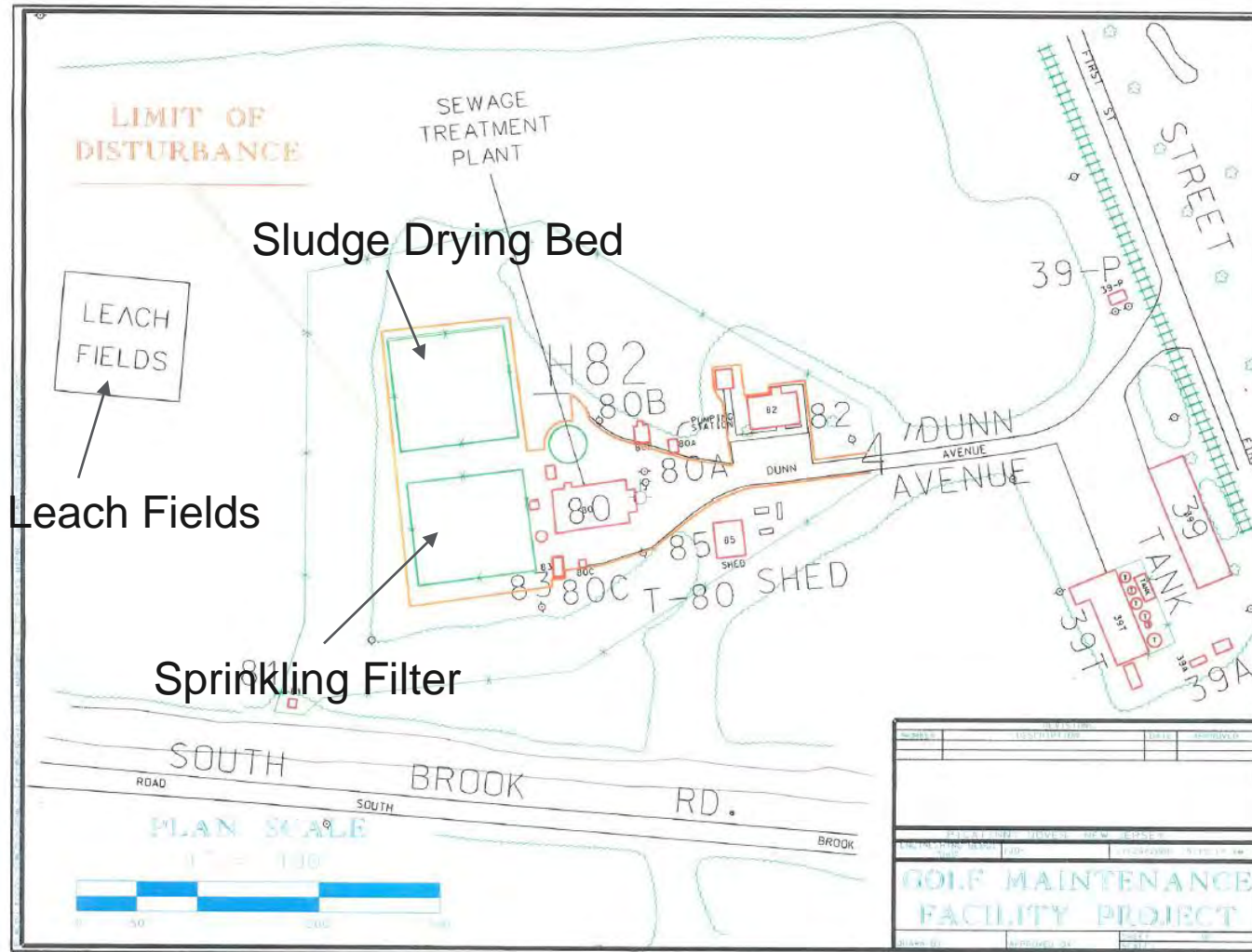


Former Waste Water Treatment System (PICA-070)

- Built in the 1940s (construction drawing available, but poor resolution)
- Decommissioned between 2005-2010
- Associated leach fields and sludge drying bed
- Sludge drying bed had clay liner and leachate collection system



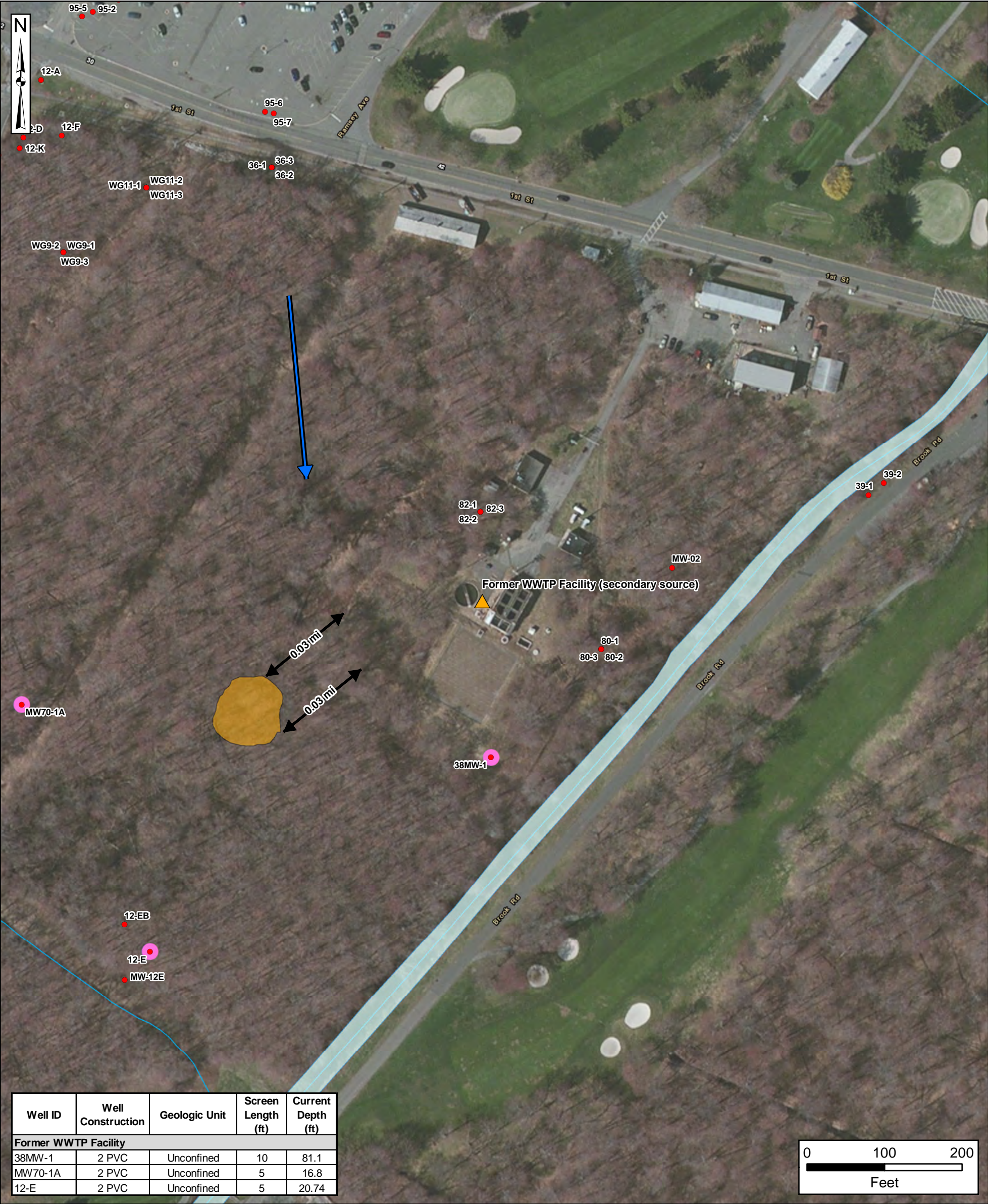
Former Waste Water Treatment System (PICA-070)





USAEC PFAS Preliminary Assessments
Picatinny Arsenal, NJ

AOPIs and Monitoring Wells
Former WWTP - Sludge Beds



- Installation Boundary
- River/Stream
- Water Body
- AOPi Location
- AFFF Use Area
- Well (EA Data, May 2018)
- Proposed Sampling Location
- Assumed GW Flow Direction in the Unconfined Aquifer
- Approximate Location of Leach Fields

Coordinate System:
WGS 1984, UTM Zone 18 North